Influence of gender in vocational preferences and personality traits in Medical students

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Influencia del sexo en las preferencias vocacionales y rasgos de personalidad en los estudiantes de Medicina

Summary

Objective. *In this paper, we try to analyze be possible relationships between gender of the Medical students, their personality and their vocational preferences.*

Material and methods. *A total of 1,482 2nd year medical students from the Valencia University were analyzed. They answered and anonymous survey on their sociodemographic characteristics and their vocational interests. We determined their personality profile with the 16 PF of Cattell. The data obtained were analyzed with the logistic regression techniques.*

Results. *Most of the population analyzed were female (62.7%) with a medium age of 20 years. The Pediatric and Gynecology-Obstetrics specialities were preferred mostly by female students and Orthopedic surgery by male students. The female students had a specific personality traits, they were more «affectionate» (A+), «conscientious» (G+), Boldness (H+), «astute» (n+) and «self-sufficient» (Q_3+). While the male students were more «toughminded» (I+), «suspicious» (L+), «practical» (M+), «rebellious Q_1(+) and «self-sufficient» Q_2(+).*

Conclusions. *Gender has a significant influence on the medical student both in their vocational preferences as well as their personality profile.*

Key words: *Personality. Gender. Medical students.*

Resumen

Objetivo. *En este artículo intentamos analizar las posibles relaciones entre el sexo de los estudiantes de Medicina, su personalidad y sus preferencias vocacionales.*

Material y métodos. *Se analizan 1.484 estudiantes de segundo curso de Medicina de la Universidad de Valencia, los que se les ha realizado una encuesta anónima sobre sus características sociodemográficas, sus intereses vocacionales y su perfil de personalidad mediante el 16 PF de Cattell. Los datos obtenidos se han analizado mediante técnicas de regresión logística.*

Resultados. *La población analizada fue de predominio femenino (62,7%) y con una edad media de 20 años. Las especialidades de Ginecología y Pediatría fueron preferidas mayoritariamente por las estudiantes de sexo femenino y la de Traumatología por los de sexo masculino. Además las estudiantes de sexo femenino presentan unas características de personalidad diferenciadas, siendo más «afectuosas» (A+), «conscientes» G (+), «emprendedoras» (H+), «astutas» (N+) y «controladas» (Q_3+). Mientras que los de sexo masculino fueron más «duros» I(+), "«suspicaces» L(+), «prácticos» M(+), «rebeldes» Q_1(+) y «autosuficientes» Q_2(+).*

Conclusiones. *Los estudiantes de Medicina presentan diferencias significativas tanto en su personalidad como en sus preferencias vocacionales según el sexo.*

Palabras clave: *Personalidad. Sexo. Estudiantes de Medicina.*

INTRODUCTION

Influence of gender in personality and vocational behavior is permanently a current issue. Traditionally, a different social role and expectations have been attributed to each gender. Vocational behavior is aimed at self-achievement, that is, at full achievement of all the individual's possibilities[1,2]. The vocational process may not only be a source of great emotional pressure and anxiety, but can also produce a noticeable lack of self-esteem and loss of self-concept in the future. Gender is a variable that not only influences the personality of the subject who performs the vocational process but also his/her expectation of the future and merits a detailed analysis[3].

In recent decades, progressive incorporation of women in the work and university setting has been observed. Medical studies have not been an exception, the female gender becoming the majority in many cases. This incorporation together with other changes has presu-

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mably produced changes in the idea of medical studies and the role of the physician.

However, we have verified that the incorporation of women has not equally affected all the medical specialities, this being greater in specialities such as pediatrics, gynecology or family medicine, while others such as traumatology or surgery continue to be preferred mostly by the male gender[4,5].

This unequal incorporation of female students to the different medical specialities can be attributed to different causes, such as greater identification of some specialities with certain feminine role attributions, greater rejection of the male students for some of these specialities, different motivation according to gender or that the different genders approach medical studies from different assumptions and that they tend to be fulfilled in different aspects within the Medical profession.

In this way, and in the specific field of Surgery, a speciality traditionally considered as masculine, Baxter[6] analyzed some different motivations and characteristics according to gender among the students who were interested in this speciality. Thus, while the males were interested in the management of the technique, prestige, and economic earnings of this speciality, the women looked for residential conditions, the possibility of part time work and the availability of their companion.

Thus, it could be thought that medical students could present different personality profiles according to gender, both due to the recent incorporation of the woman to medical studies that were traditionally attributed to the man as well as due to their preference for certain specialities. Although this subject has interested many authors, we have not found any papers that specifically analyze the question in the whole of the medical students.

In this article, we set out to perform an extensive study on the influence of gender in the preference of the students for the different medical specialities as well as the possible existence of some differentiated personality profiles among the male and female gender students.

METHOD

The population studied were second year medical school students from Valencia (Spain) in the 1988-1993 school years. No inclusion or exclusion criteria were applied as the study was aimed at the complete student population.

The data were collected using an anonymous survey on sociodemographic characteristics, vocational interests and the profile of the personality of the students.

The sociodemographical characteristics collected were age, gender and civil status.

Vocational interests of the students were grouped into 8 large speciality groups:

1. General surgery and its subspecialities.
2. General medicine and internal medicine with their subspecialities.
3. Gynecology and Obstetrics.
4. Pediatrics.
5. Psychiatry.
6. Traumatology, a speciality that we have considered in a group apart from Surgery as it has an extensive number of interested subjects and presents some specific characteristics within the group of surgical specialities.
7. «Sensorial specialities», that include Ophthalmology, Stomatology, Otorhinolaryngology and Dermatology.
8. «Other specialities» with Analysis, Anesthesia, Radiology, etc.

The personality profile of the students was measured with the 16 PF Test of Cattell in its Form A for adults[6]. The «16 PF of Cattell» has high reliability and validity demonstrated in many studies. Although the test was initially performed in the American population, there is a perfect adaptation of validation for the Spanish university population.

The «16 PF» contributes a complete description of the personality, providing specific data and an assessment of it as a whole. It also makes it possible to detect and correct those cases with limited or deviated motivation. It is made up of 16 scales described as first and second order factors. The 1st order factors are: Factor A: sizothymia-affectothymia. Factor B: low-high intelligence. Factor C: low-high ego strength. Factor E: submissiveness-dominance. Factor F: desurgency-surgency. Factor G: low-high superego strength. Factor H: threctia-parmia. Factor I: harria-premsia. Factor L: alaxia-protension. Factor M: praxernia-autia. Factor N: artlessness-astuteness. Factor O: untroubled adequacy-guilt proneness. Factor Q_1: conservatism-radicalism. Factor Q_2: group adherence-self-sufficiency. Factor Q_3: low integration- high self concept control. Factor Q_4: low-high ergic tension. And the 2nd order factors are: Factor Q_I: adjustment-anxiety. Factor Q_{II}: introversion-extraversion. Factor Q_{III}: low-high controlled socialization. Factor Q_{IV}: dependence-independence.

In order to analyze these data and corroborate a possible relationship between the gender of the medical students and their personality traits and their vocational preference for the different medical specialities, we have applied multivariate statistical techniques; specifically we have performed two logistic regressions. The dependent variable is the gender of the students and the independent ones are personality factors in one case according to the 16 PF and the different vocational options of the students in the other.

RESULTS

The total number of students analyzed were 1484, 105 of whom were rejected due to incomplete answering of the test or score greater than 10 on the motivational deviation scale or than 5 in that of negation. Predominant gender in the sample was female, this representing 62.7%. Mean age was 20 years.

Regarding vocational preferences, the speciality preferred most by the *complete group of students* was Internal-

General Medicine, followed by Surgery, Pediatrics, Gynecology, Psychiatry, Traumatology, «Sensorial Specialities» and the group of «others». The *masculine gender students* preferred Internal-General Medicine in the first place, followed by Surgery, however, they preferred Traumatology in the third place, followed by Psychiatry, Pediatrics, «Sensorial S.», Gynecology, and the group of «others». The *feminine gender students* preferred Internal-General Medicine in the first place, followed by Surgery, Pediatrics, Gynecology, Psychiatry, «Sensorial S.». Traumatology and the group of «others». Table 1 explains the percentages of the different specialities in the whole of the sample by genders as well as the mean age of each group with their standard deviation.

After performing the logistic regression process to assess the influence of gender of the students on their vocational preferences, we obtained an explanatory model of it. The description of each one of the variables included in this model appears in table 2. The graphic representations of the probability that those students who chose a certain speciality will be a woman according to this model appear in figure 1. As we see, Pediatrics and Gynecology specialities are preferred by the female gender significantly in a percentage that is greater than in the complete sample, while the speciality of Traumatology and the group of «others» are preferred by the masculine gender.

TABLE 1. Distribution of the «speciality and gender groups»

	No. of cases	*% cases*	*Mean age*	*SD*
Surgery				
Total	245	16.47	19.46	1.2
Male	99	40.4	19.63	1.28
Female	146	59.6	19.34	1.13
Sensorial S.				
Total	89	5.98	19.52	1.15
Male	31	34.8	12.87	1.63
Female	58	65.2	19.33	0.74
Gynecology				
Total	146	9.81	19.43	1.14
Male	21	14.4	19.29	0.56
Female	125	85.6	19.45	1.21
Internal medicine				
Total	278	18.68	19.89	2.69
Male	113	40.6	20.38	3.37
Female	165	59.4	19.56	2.04
Others				
Total	51	3.43	19.88	2.26
Male	25	49	19.87	1.85
Female	26	51	19.88	2.61
Pediatrics				
Total	163	10.95	19.46	3.19
Male	32	43.3	19.19	1.85
Female	131	56.7	19.52	3.56
Psychiatry				
Total	120	8.06	19.58	1.97
Male	44	36.7	19.56	0.85
Female	76	63.3	19.6	2.39
Trauma				
Total	112	7.53	19.67	2.95
Male	67	59.8	20.01	3.76
Female	45	40.2	19.16	0.56

TABLE 2. Specialities according to gender. Adjustment of each variable

Variables	*Coef.*	*SE*	*Odds*	*95% CI*	*p*
Cons.	–0.3399	0.2019			0.0923
Surgery	0.7800	0.2452	2.18	1.35-3.53	0.0015
Esp.	1.0891	0.3121	2.97	1.61-5.48	0.0005
Gyne.	1.1399	0.3147	8.50	4.59-15.75	< 0.0001
Int. M.	0.7644	0.2380	2.15	1.35-3.42	0.0013
Others	0.2990	0.3499	1.35	0.68-2.68	0.3927
Pediatrics	1.8597	0.2903	6.42	3.64-11.34	< 0.0001
Psychi.	0.8557	0.2840	2.35	1.35-4.11	0.0026

The *personality profile of the complete group of students* is located within the normality range except for those factors that refer to the control of anxiety (factor Q_4: 6.86 and Q_I: 7.65) and guilt proneness (factor O: 7). The graphic representation of the personality profiles of both genders according to the 16 PF appear in figure 2.

According to this personality profile, we see that the male gender students stood out for being «reserved» (A–), «with little superego strength» (G–), «timid» (H–), «suspiciousness» (L+), «self-sufficient» (Q_2+), «with difficulties to control themselves» (Q_3–) and «introverted» (Q_{II}–), not only more intensely than the female gender but also with scores outside of the normal pattern in the personality traits.

The female profile is characterized by having a «greater practical sense» (M–) and being «more extroverted»

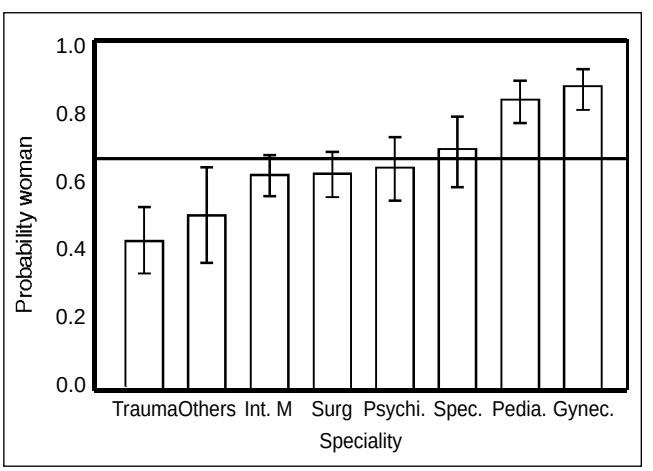

Fig. 1. Probability that students who choose a certain speciality will be a woman. *Note:* The horizontal line represents the proportion of women in the sample (65.29%) and the bars of error are the confidence intervals at 95%.

Factors	*Average*										*Fct*	*Male*	*Female*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*			
Reserved-affectionate	o	o	o	o			o	o	o	o	A	3.84	5.29
Low intelligence	o	o	o	o			o	o	o	o	B	6.52	5.98
Emotional instability-stability	o	o	o	o			o	o	o	o	C	4.63	5.12
Submissive-dominant	o	o	o	o			o	o	o	o	E	5.70	5.28
Seriousness-impulsivity	o	o	o	o			o	o	o	o	F	6.07	6.35
Untroubled-conscientious	o	o	o	o			o	o	o	o	G	4.30	5.50
Self-conscious-enterprising	o	o	o	o			o	o	o	o	H	4.10	5.13
Toughminded-tenderminded	o	o	o	o			o	o	o	o	I	5.97	5.17
Trusting-suspicious	o	o	o	o			o	o	o	o	L	6.90	5.92
Practical-imagination	o	o	o	o			o	o	o	o	M	5.20	4.22
Forhright-astute	o	o	o	o			o	o	o	o	N	4.58	5.46
Self-confident-apprehensive	o	o	o	o				o	o	o	O	7.11	6.94
Conservative-radical	o	o	o	o			o	o	o	o	Q_1	5.29	4.48
Dependent-self-sufficient	o	o	o	o			o	o	o	o	Q_2	6.91	5.67
Uncontrolled-controlled	o	o	o				o	o	o	o	Q_3	3.71	5.04
Relaxed-tense	o	o	o	o				o	o	o	Q_4	7.25	6.64
Second order factors and profile													
Relaxed-nervous	o	o	o	o					o	o	Q_I	8.12	7.39
Introversion-extraversion	o	o	o	o			o	o	o	o	Q_{II}	4.20	6.68
Controlled socialization	o	o	o	o			o	o	o	o	Q_{III}	4.82	4.98
Dependence-independence	o	o	o	o			o	o	o	o	Q_{IV}	5.51	4.61

Gender male | Gender female

Fig. 2. Personality profile of the medical students according to gender.

(Q_{II}+) and «more conservative» (Q_1–), not only in a more noticeably way than the males but also outside the normality pattern.

Both groups, males and females, presented proneness to guilt, anxiety, floating anxiety, superior to the normal value (factors O, Q_4 and Q_I), as we have seen on analyzing the whole of the population analyzed.

The logistic regression process performed in order to obtain an explanatory model of the relationship between the 1st order personality factors according to the 16 PF of Cattell and gender of the students emphasizes that factors A, B, G, H I, L, M, N, Q_1, Q_2, Q_3 are useful to discriminate the gender of the students. The description of these variables appears in table 3.

After the study of the Logistic Regression model and of the characteristics of each one of the variables that make up this model, we can say that basically, when the joint profile of personality is considered, the proportion of

TABLE 3. Personality factors and gender. Final logistic regression model

Variables	*Coef.*	*SE*	*Odds*	*95% CI*	*p (Wald)*
Cons.	0.7636	0.6758			
A	0.2210	0.0404	1.25	1.15-1.35	< 0.0001
B	–0.1219	0.0420	0.89	0.82-0.96	0.0037
G	0.1634	0.0418	1.18	1.08-1.28	< 0.0001
H	0.3097	0.0416	1.36	1.26-1.48	< 0.0001
I	–0.1505	0.0363	0.86	0.80-0.92	<0.0001
L	–0.2233	0.0398	0.80	0.74-0.86	< 0.0001
M	–0.1134	0.0388	0.89	0.83-0.96	0.0035
N	0.1411	0.0382	1.15	1.07-1.24	0.0002
Q_1	–0.0653	0.0359	0.94	0.87-1.01	0.0687
Q_2	–0.2768	0.0411	0.76	0.70-0.82	< 0.0001
Q_3	0.3367	0.0453	1.40	1.28-1.53	< 0.0001

women increases as the score increases in A (reserved-affectionate), G (strength of superego), H (boldness), N (artlessness-astuteness) and Q_3 (self control), while the proportion of men increases as the score increases in B (intelligence), I (emotional sensitivity), L (suspiciousness), M (practical-imaginative), Q_1 (conservatism-radicalism) and Q_2 (dependence-self-sufficiency).

Personality factors C (strength of ego), E (submissiveness-dominance), F (seriousness-impulsivity), O (proneness to guilt) and Q_4 (floating anxiety) do not seem to discriminate between men and women.

COMMENTS

In our study, when we analyzed the influence of gender in the vocational preferences of the Medical students, we found a preference of the masculine students with the group of «Traumatology» and the heterogeneous of «others» while the feminine gender preferred those of «Gynecology-Obstetrics» and «Pediatrics».

Within this line, many authors have found an influence of gender in the preference for the different medical specialities. Already in 1977, McGrath and Zimet[8], when they assessed the students of the University of Colorado, observed significant differences between the vocational preferences of the male and female students. While the women preferred Family Medicine and Pediatrics, the men preferred Internal Medicine and Surgery.

More recent studies have verified the tendency of women to prefer the specialities of «Family Medicine», «Pediatrics» or «Gynecology-Obstetrics» and of men to prefer the speciality of Surgery, while other specialities such as Psychiatry show no differentiated predilection between both genders[4,9-12]. In the study of Bland[4], it is stressed that although the tendency of women to chose Pediatrics and men prefer Surgery still exists, this tendency has had a decreasing evolution in recent years.

Baxter et al[6] observed greater preference by the male students for the surgical specialities compared to medical, and especially in the case of traumatology and urology. This is justified, among other factors, by a series of associated values in the surgical subject that would coincide more with the male role.

Our study verifies the greater preference by women for the specialities of Pediatrics and Gynecology-Obstetrics, as shown by most of the bibliography. On the contrary, the tendency of the male gender to choose the speciality of «Surgery» did not significantly differ from the general sample as in most of the studies, but did so in Traumatology. This speciality is generally included within the Surgery group.

We consider that the fact that the male gender did not show greater preference than the female one for the Surgery speciality but did so for the Traumatology one in our sample could be due to several causes: 1) to characteristics of our sample; 2) because the greater preference of the males for the specialities of Surgery that appears in other studies is due to, above all, Orthopedic Surgery (included in these studies on Surgery), y 3) because the progressive equaling in the preferences for Surgery in both genders described in these recent years by different authors has principally affected other subspecialities of Surgery and not especially that of Traumatology.

Some studies also mentioned a greater preference by women towards Family Medicine that has not been verified in our study. The greater preference by the male gender for the group of «others» is difficult to interpret given its heterogeneity and the lack of bibliography that verifies this tendency.

In summary, we can say that the variable gender influences significantly in the vocational choice of the medical student population, the female gender students having the preference for the specialities of Gynecology and Pediatrics and the male one for Traumatology.

In regards to the relationship between the personality traits and gender of the medical students, we observe differences between the male and female gender students in many factors. The statistical analysis performed stressed that the female gender students tended to have high scores in regards the males in the factors A (affectivity), G (unworried-consciousness), H (boldness), N (artlessness-astuteness) and Q_3 (self-control) and the masculine gender in the factors B (intelligence), I (emotional sensitivity), L (suspiciousness), M (practical-imaginative), Q_1 (conservatism-radicalism) and Q_2 (sufficiency).

In the bibliography obtained, we have found other studies carried out with the 16 PF by different authors who also found differences in the personality of the students according to their gender. Green et al[13], in their study performed with the 16 P.F. in a sample of Medical students found that men scored within normality and women low in M (practical-imaginative) and Q_2 (sufficiency). Our study partially repeats these results since the women were markedly more «practical» (M–) and «dependent» (Q_2–) than the men, although without the normal value. However, and on the contrary to this author,

the personality profile of the males obtained by us presents values outside normality in several factors, with tendency to show a pattern or immaturity or insecurity as they are «reserved» (A–), «with little strength of superego» (G–), «timid» (H–), «suspiciousness» (L+), «self-sufficient» (Q_2+), «with difficulties to control themselves» (Q_3–) and «introverted» (Q_{II}). The differences in the personality pattern in our sample among both genders could support the idea that the woman could «mature» or assume «roles of responsibility» before at these ages (around 20 years) and in the Hispanic culture.

Another study performed with the 16 PF was that of Peng et al[14] that found, in a sample of students, high scores in the men in «impulsivity» and «boldness» (F+ y H+) and the women had greater «strength of superego», more «suspiciousness» and greater «self-control» (G+, L+ and Q_3) than the men. In regards to this study, in our study, the women also had significantly more «strength of superego», more «suspiciousness» and greater «self-control» (G+, L+ and Q_3+), however the men did not have a higher score on the «boldness» scale (H+). Significant diffe-rences were not found between genders in the «impulsivity» scale (F+).

Other authors, using different psychometric tests have also found differences in the personality of the Medical students according to gender. Thus, Mc Grath and Zimet[8], on applying the ACL to a sample of students, observed that men scored higher in aggressivity, affiliation to the group and postponement of problems while the female students did so in self-confidence and autonomy.

When a «scale of social desire» was applied to the medical students, Bland et al[15] and Markhan[16] observed that the female gender presented higher scores in the psychosocial and extroversion orientation than the men. Our study seems to verify indirectly these investigations as the female gender students are more «affectionate» (A+) and less «suspiciousness» (L-) than their male homologues. The women also presented a score above the normal pattern in the Scale of extroversion (Q_{II}+).

When Stilwell et al[17] studied the medical students with the MBTI over time, he found differences between the profile of men and women: women present a greater tendency to introversion and feeling «types», while men present it to extroversion and «thinking» types.

Other authors who found differences in certain aspects of the personality of the medical students according to gender were: Merrill et al[18] in the maquiavelism scale. Rojo et al in their vocational definition[20], Coutts and Rogers[19] in their self-evaluation capacity in the clinical tests. Elam et al[21] found a greater percentage of academic failure among female students while we found a greater percentage of academic delay in the masculine gender in a previous study in our setting[22].

When they applied some depression or anxiety scales in their study on 149 students of the 2nd year, Steewat and Betson[23] did not find differences in gender. In our study, although the 16 PF is not designed to directly measure anxiety, the scales refer to it («factor O: proneness to guilt"» and factor Q_4: floating anxiety»), although they also do not show differences between gender.

Thus, we can conclude that gender influences both the vocational preferences of the medical students as well as their personality traits:

— Female students for the specialities of Gynecology and Pediatrics and the Male gender for Traumatology.
— They also present some differentiated personality characteristics, these being more «affectionate» (A+), «conscientious» G(+), «enterprising» (H+), «astute» (N+) and «controlled» (Q_3). While those of the male gender were «more toughminded» I(+), «suspicious» L(+), «practical» M(+), «rebellious» Q_1(+) and «self-sufficient» Q_2(+).

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